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In chap. x, on the history of development of Jo Daviess County, the lead-zinc mining industry is recognized as the cause of the early settlement and development of the region. The rough topography and relatively thin and infertile soils of the Driftless Area make agriculture less profitable here than in the surrounding glaciated country.

H. R. B.

Geology of the Navajo Country. A Reconnaissance of Parts of Arizona, New Mexico, and Utah. By Herbert E. Gregory. U.S. Geological Survey, Professional Paper No. 93. 4to, pp. 161; maps.

This useful and valuable summary of Professor Gregory's long studies of the Navajo country covers an area of more than twenty thousand square miles, a region inhabited almost exclusively by the Navajo, Hopi, and San Juan Indians. The report deals fully with the geography, stratigraphy, igneous rocks, structure, physiography, and economic geology of this little-known region, and is illustrated with numerous photographs and two pocket maps of the geography and geology.

The sedimentary rocks, from the Pennsylvanian to the Eocene, with part of which at least the reviewer has some acquaintance, are treated extensively in their various subdivisions. The descriptions and illustrations will serve as an excellent guide to the future explorer. Their correlation is in part one of peculiar difficulty because of the absence of characteristic fossils. Permian strata are identified with doubt. No fossil vertebrates have hitherto been discovered in this region, but the reviewer confidently believes that they will be in future, probably in the lower part of the Moenkopi and underlying formations. The strata referred to the De Chelly formation are certainly higher than the fossiliferous Permian beds farther east, and might with equal propriety be called Lower Triassic. The Shinarump conglomerate, lying below Upper Triassic strata, as determined by their vertebrate fossils, is not only widespread throughout this region, but is identified with assurance by the present writer as far north as the Wind River Range in western Wyoming. It seems everywhere to be a reliable guide to the fossiliferous Triassic beds immediately above it. The fossil-bearing Chinle beds of the Upper Triassic are doubtless equivalent in age to those called by the writer the Popo Agie beds some years ago. Their description is characteristic.

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So also the Jurassic is recognized with doubt in the Navajo, Toldito, and Wingate sandstones of from four hundred to fifteen hundred feet in total thickness. Doubtless they include the equivalent of the Baptanodon beds of Wyoming, which in the southern part of that state are also represented by massive sandstones. But just how much of these sandstones will prove to be of Jurassic age is doubtful. The McElmo, which farther east may be represented by dark-colored shales, is also doubtfully located in the Jurassic. It probably includes the equivalent of the Morrison beds, which from the north to the south become progressively more sandstone, and should, the writer thinks, be included in the Comanche or Lower Cretaceous.

The more precise correlation of the Mesaverde and Mancos beds with the Colorado and Montana groups of the Cretaceous ought not to be a matter of difficulty. The writer, from his observations in the Gallina Mountain region, just east of the San Juan Wasatch beds, believes that he identified both the Benton and Niobrara from characteristic fossils. It is much to be desired that local geological names should be abandoned wherever possible. For instance, the Eagle Ford and Austin shales of Texas are positively and precisely correlated with the Benton and Niobrara of Kansas by their vertebrate fossils, and their names should be abandoned.

The limited outcrops of Tertiary rocks in the Chuska Mountains and farther to the southwest are referred with doubt to the Eocene, because of the absence of fossils.

Altogether Professor Gregory's work in these fields will serve as an excellent guide to the future explorer. Much remains to be done in the more precise correlation of the strata; and the prospects for the vertebrate paleontologist, at least, are full of encouragement; he has been groping hitherto.

S. W. W.